

109TH CONGRESS
1ST SESSION

H. R. 1793

To promote fusion energy development in the United States.

IN THE HOUSE OF REPRESENTATIVES

APRIL 21, 2005

Ms. ZOE LOFGREN of California (for herself, Mr. CUNNINGHAM, Mr. McGOVERN, Mr. EHLERS, Mr. HOLT, Mr. BUTTERFIELD, Ms. BALDWIN, and Mr. HONDA) introduced the following bill; which was referred to the Committee on Science

A BILL

To promote fusion energy development in the United States.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Fueling the U.S.A.
5 Through Unlimited Reliable Energy Act of 2005”.

6 **SEC. 2. FINDINGS.**

7 The Congress finds the following:

8 (1) Economic prosperity and national security
9 are closely linked to an affordable and ample energy
10 supply.

1 (2) Environmental quality is closely linked to
2 energy production and use.

3 (3) Population, worldwide economic develop-
4 ment, energy consumption, and stress on the envi-
5 ronment are all expected to increase substantially in
6 the coming decades.

7 (4) The few energy options with the potential to
8 meet economic and environmental needs for the
9 long-term future should be pursued as part of a bal-
10 anced national energy plan.

11 (5) Fusion energy is an attractive long-term en-
12 ergy source due to virtually inexhaustible supply of
13 fuel, its potential as a substantial energy source re-
14 quiring relatively little land mass, and its promise of
15 minimal environmental impact and inherent safety.

16 (6) The National Research Council, the Presi-
17 dent's Committee of Advisors on Science and Tech-
18 nology, and the Secretary of Energy Advisory Board
19 have each recently reviewed the Fusion Energy
20 Sciences Program and each strongly supports the
21 fundamental science and creative innovation of the
22 program and has confirmed that progress toward the
23 goal of producing practical fusion energy has been
24 excellent, although much scientific and engineering
25 work remains to be done.

1 (7) Each of these reviews and United States fu-
2 sion scientists have stressed the need for a magnetic
3 fusion burning experiment to address key scientific
4 issues and as a necessary step in the development of
5 fusion energy.

6 (8) Further, the United States fusion research
7 community has developed a strong consensus that
8 the first option for United States involvement in a
9 burning plasma experiment should be through the
10 international experiment known as “ITER” and
11 that, should the ITER experiment fail to go forward,
12 then the construction of a domestic burning plasma
13 experiment should be pursued aggressively.

14 (9) The National Research Council has also
15 called for a broadening of the Fusion Energy
16 Sciences Program research base as a means to more
17 fully integrate the fusion science community into the
18 broader scientific community.

19 (10) The Fusion Energy Sciences Program
20 budget is inadequate to support the necessary
21 science and innovation for the present generation of
22 experiments, and cannot accommodate the cost of
23 participation in or construction of a burning plasma
24 experiment.

1 (11) The Department of Energy’s Fusion En-
2 ergy Sciences Advisory Committee has been recently
3 tasked with the development of a plan to dem-
4 onstrate the provision of fusion power to the United
5 States electric grid within 35 years. Although this
6 effort is to be commended, Congress finds that the
7 importance of the development of fusion energy war-
8 rants that every effort be made to credibly accelerate
9 this timeframe.

10 **SEC. 3. GOALS.**

11 It shall be the goal of the United States to dem-
12 onstrate electric power and hydrogen production for the
13 United States energy grid utilizing a fusion energy device
14 at the earliest date possible. It shall also be the goal of
15 the United States to develop the scientific, engineering,
16 and commercial infrastructure necessary to ensure that
17 the United States is wholly competitive with other nations
18 in providing fusion energy for its own needs and the needs
19 of other nations.

20 **SEC. 4. PLAN FOR FUSION ENERGY SCIENCES PROGRAM.**

21 (a) DECLARATION OF POLICY.—It shall be the policy
22 of the United States to conduct research, development,
23 demonstration, and commercial application activities to
24 provide for the scientific, engineering, and commercial in-
25 frastructure necessary to ensure that the United States

1 is competitive with other nations in providing fusion en-
2 ergy for its own needs and the needs of other nations, in-
3 cluding by demonstrating electric power or hydrogen pro-
4 duction for the United States energy grid utilizing fusion
5 energy at the earliest date possible.

6 (b) FUSION ENERGY PLAN.—

7 (1) IN GENERAL.—Not later than 6 months
8 after the date of enactment of this Act, the Sec-
9 retary of Energy shall transmit to Congress a plan
10 for carrying out the policy set forth in subsection
11 (a), including cost estimates, proposed budgets, po-
12 tential international partners, and specific programs
13 for implementing such policy.

14 (2) REQUIREMENTS OF PLAN.—Such plan shall
15 also ensure that—

16 (A) existing fusion research facilities are
17 more fully utilized;

18 (B) fusion science, technology, theory, ad-
19 vanced computation, modeling, and simulation
20 are strengthened;

21 (C) new magnetic and inertial fusion re-
22 search facilities are selected based on scientific
23 innovation, cost effectiveness, and their poten-
24 tial to advance the goal of practical fusion en-
25 ergy at the earliest date possible;

1 (D) the facilities that are selected are
2 funded at a cost-effective rate;

3 (E) communication of scientific results and
4 methods between the fusion energy science com-
5 munity and the broader scientific and tech-
6 nology communities is improved;

7 (F) inertial confinement fusion facilities
8 are utilized to the extent practicable for the
9 purpose of inertial fusion energy research and
10 development;

11 (G) attractive alternative inertial and mag-
12 netic fusion energy approaches are more fully
13 explored; and

14 (H) to the extent practical, the rec-
15 ommendations of the March 2004 Fusion En-
16 ergy Sciences Advisory Committee report on
17 Workforce Planning are carried out, including
18 periodic assessment of program needs.

19 (3) REPORT ON FUSION MATERIALS AND TECH-
20 NOLOGY PROJECT.—The plan required by this sub-
21 section shall also address the status of, and to the
22 degree possible, the costs and schedules for—

23 (A) the design and implementation of
24 international or national facilities for the test-
25 ing of fusion materials; and

1 (B) the design and implementation of
2 international or national facilities for the test-
3 ing and development of key fusion technologies.

4 **SEC. 5. ITER.**

5 (a) AGREEMENT.—(1) The Secretary of Energy is
6 authorized to negotiate an agreement for United States
7 participation in ITER.

8 (2) Any agreement for United States participation in
9 ITER shall, at a minimum—

10 (A) clearly define the United States financial
11 contribution to construction and operating costs;

12 (B) ensure that the share of ITER's high-tech-
13 nology components manufactured in the United
14 States is at least proportionate to the United States
15 financial contribution to ITER;

16 (C) ensure that the United States will not be fi-
17 nancially responsible for cost overruns in compo-
18 nents manufactured in other ITER participating
19 countries;

20 (D) guarantee the United States full access to
21 all data generated by ITER;

22 (E) enable United States researchers to propose
23 and carry out an equitable share of the experiments
24 at ITER;

1 (F) provide the United States with a role in all
2 collective decisionmaking related to ITER; and

3 (G) describe the process for discontinuing or
4 decommissioning ITER and any United States role
5 in that process.

6 (b) PLAN.—The Secretary of Energy, in consultation
7 with the Fusion Energy Sciences Advisory Committee,
8 shall develop a plan for the participation of United States
9 scientists in ITER that shall include the United States
10 research agenda for ITER, methods to evaluate whether
11 ITER is promoting progress toward making fusion a reli-
12 able and affordable source of power, and a description of
13 how work at ITER will relate to other elements of the
14 United States fusion program. The Secretary shall request
15 a review of the plan by the National Academy of Sciences,
16 the results of which the Secretary shall transmit to Con-
17 gress not later than 90 days after the date of enactment
18 of this Act.

19 (c) LIMITATION.—No Federal funds shall be ex-
20 pended for the construction of ITER until the Secretary
21 of Energy has transmitted to Congress—

22 (1) the agreement negotiated pursuant to sub-
23 section (a) and 120 days have elapsed since that
24 transmission;

1 (2) a report describing the management struc-
2 ture of ITER and providing a fixed dollar estimate
3 of the cost of United States participation in the con-
4 struction of ITER, and 120 days have elapsed since
5 that transmission;

6 (3) a report describing how United States par-
7 ticipation in ITER will be funded without reducing
8 funding for other programs in the Office of Science,
9 including other fusion programs, and 60 days have
10 elapsed since that transmission; and

11 (4) the plan required by subsection (b) (but not
12 necessarily the National Academy of Sciences review
13 of that plan), and 60 days have elapsed since that
14 transmission.

15 **SEC. 6. PLAN FOR FUSION EXPERIMENT.**

16 If at any time during the negotiations on ITER, the
17 Secretary determines that construction and operation of
18 ITER is unlikely or infeasible, the Secretary shall send
19 to Congress, as part of the budget request for the fol-
20 lowing year, a plan for implementing a domestic burning
21 plasma experiment such as FIRE, including costs and
22 schedules for such a plan. The Secretary shall refine such
23 plan in full consultation with the Fusion Energy Sciences
24 Advisory Committee and shall also transmit such plan to
25 the National Academy of Sciences for review. The Sec-

1 retary shall transmit the results of that review to Congress
2 not later than 1 year after the date of enactment of this
3 Act.

4 **SEC. 7. DEFINITIONS.**

5 As used in this Act—

6 (1) the term “construction” means the physical
7 construction of the ITER facility, and the physical
8 construction, purchase, or manufacture of equipment
9 or components that are specifically designed for the
10 ITER facility, but does not mean the design of the
11 facility, equipment, or components;

12 (2) the term “FIRE” means the Fusion Igni-
13 tion Research Experiment, the fusion research ex-
14 periment for which design work has been supported
15 by the Department of Energy as a possible alter-
16 native burning plasma experiment in the event that
17 ITER fails to move forward; and

18 (3) the term “ITER” means the international
19 burning plasma fusion research project in which the
20 President announced United States participation on
21 January 30, 2003.

22 **SEC. 8. AUTHORIZATION OF APPROPRIATIONS.**

23 (a) FUSION ENERGY SCIENCES PROGRAM.—There
24 are authorized to be appropriated to the Secretary of En-

1 ergy for the Fusion Energy Sciences Program, excluding
2 activities described in sections 5 and 6—

3 (1) for fiscal year 2006, \$335,000,000;

4 (2) for fiscal year 2007, \$349,000,000;

5 (3) for fiscal year 2008, \$362,000,000;

6 (4) for fiscal year 2009, \$377,000,000; and

7 (5) for fiscal year 2010, \$393,000,000.

8 (b) ITER.—There are authorized to be appropriated
9 to the Secretary of Energy for activities described in sec-
10 tion 5 such sums as are necessary for each of the fiscal
11 years 2006 through 2010.

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